

CLAIMS

I claim:

1. A method for processing a call in a telecommunications system comprising at least a first and second switch, the method comprising:

5 storing correlation information for a first call leg related to a service request directed to the second switch by the first switch;

detecting an attempt to establish a second call leg forming a hairpin loop in conjunction with the first leg, wherein the detecting is based at least on the stored correlation information; and

10 based at least on detecting the attempt to establish the second call leg forming a hairpin loop in conjunction with the first leg, releasing at least the first call leg.

2. The method of claim 1 wherein the detecting comprises comparing
15 call setup signaling information associated with the first leg with call signaling information associated with the attempted second leg.

3. The method of claim 1 wherein the detecting comprises comparing
20 calling party number signaling information associated with the first leg with calling party number signaling information associated with the attempted second leg.

4. The method of claim 1 wherein the detecting comprises comparing
25 billing number signaling information associated with the first leg with billing number signaling information associated with the attempted second leg.

5. The method of claim 1 wherein
the detecting takes place during attempted routing of the call to a destination;
and
the call is routed to the destination.

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6. The method of claim 1 wherein the detecting comprises comparing billing number information associated with the first leg with a billing number parameter of an Initial Address Message associated with the attempted second leg.

5 7. The method of claim 2 wherein the call setup signaling information originates from an initial address message as part of ANSI-ISUP signaling.

8. The method of claim 7 wherein the call setup signaling information comprises a calling party identifier.

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9. The method of claim 7 wherein the call setup signaling information comprises a charge number.

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10. The method of claim 7 wherein the call setup signaling information comprises a charge number and a calling party number.

11. The method of claim 2 wherein the call setup signaling information originates from a setup message as part of ISDN-PRI signaling.

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12. The method of claim 2 wherein the call setup signaling information originates from R1 Feature Group-D signaling comprising an Automatic Number Identification field.

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13. The method of claim 2 wherein the call setup signaling information originates in a GSM network.

14. The method of claim 1 wherein the detecting comprises consulting trunk type associated with the attempted second leg.

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15. The method of claim 1 wherein the detecting comprises comparing trunk membership associated with the attempted second leg against a list of trunks designated for comparison.

16. The method of claim 1 further comprising:
selecting a temporary identity from a pool of identities; and
substituting the temporary identity for an actual identity associated with the
5 call.

17. The method of claim 1 wherein:
the service request is a request for directory assistance; and
a destination of the call is determined as a result of the directory assistance.
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18. The method of claim 1 wherein:
the service request is a request for accessing voicemail messages; and
a destination of the call is determined as a result of accessing voicemail
messages.
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19. The method of claim 1 wherein:
the service request is a request for voice-activated dialing; and
a destination of the call is determined as a result of voice-activated dialing.

20. The method of claim 1 wherein:
the service request is a request for prepaid services.
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21. A computer-readable medium comprising computer-executable
instructions for performing at least the following to process a directed signal in a
25 system comprising at least a first and second switch:

storing correlation information for a first leg related to a service request
directed to the second switch by the first switch;

detecting an attempt to establish a second leg forming a hairpin loop in
conjunction with the first leg, wherein the detecting is based at least on the stored
30 correlation information; and

based at least on detecting the attempt to establish the second leg forming a
hairpin loop in conjunction with the first leg, releasing at least the first leg.

22. A method comprising:
at a switch in a telecommunications network, initiating an outgoing call leg,
wherein a first identifier is associated with the outgoing call leg;

5 at the switch, receiving an incoming call leg, wherein a second identifier is
associated with the incoming call leg;

correlating the outgoing call leg and the incoming call leg based at least on
the identifiers; and

responsive to correlating the outgoing call leg and the incoming call leg,
10 processing the outgoing call leg and the incoming call leg as a hairpin loop.

23. The method of claim 22 further comprising:
determining the first identifier from call setup signaling associated with the
outgoing call leg; and

15 determining the second identifier from call setup signaling associated with
the incoming call leg.

24. The method of claim 22 further comprising:
determining the first identifier from a billing number parameter associated
20 with an Initial Address Message associated with the outgoing call leg; and
determining the second identifier from a billing number parameter associated
with an Initial Address Message associated with the incoming call leg.

25. The method of claim 22 wherein processing the call legs as a hairpin loop comprises:

releasing the incoming call leg.

5 26. The method of claim 22 wherein processing the call legs as a hairpin loop comprises:

parking a call leg; and

applying silence to the parked call leg.

10 27. The method of claim 26 wherein processing the call legs as a hairpin loop further comprises:

releasing the outgoing call leg.

15 28. A method for processing a call in a telecommunications network comprising at least a first and second switch, the method comprising:

for the call, establishing a first leg, the first leg resulting from a service request directed by the first switch to the second switch;

20 for the call, detecting a request to establish a second leg forming a hairpin loop in conjunction with the first leg, the second leg being the call directed by the second switch to the first switch, wherein the detecting is based at least on call setup signaling information for the second leg; and

based at least on detecting the request to establish the second leg forming a hairpin loop in conjunction with the first leg, releasing at least the first leg while maintaining connectivity for the call.

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29. The method of claim 28 wherein the call setup signaling information for the second leg comprises an Automatic Number Identification parameter.

30 30. The method of claim 28 wherein the call setup signaling information for the second leg comprises a parameter from an Initial Address Message according to an ISUP signaling protocol.

31. The method of claim 28 wherein the call setup signaling information for the second leg comprises a Calling Party Number parameter from a Setup Message according to an ISDN-PRI signaling protocol.

5 ~~32.~~ A computer-readable medium comprising computer-executable instructions for performing at least the following to process a call in a telecommunications network comprising at least a first and second switch:

for the call, establishing a first leg, the first leg resulting from a service request directed by the first switch to the second switch;

10 for the call, detecting a request to establish a second leg forming a hairpin loop in conjunction with the first leg, the second leg being the call directed by the second switch to the first switch, wherein the detecting is based at least on call setup signaling information for the second leg; and

15 based on detecting the request to establish the second leg forming a hairpin loop in conjunction with the first leg, releasing at least the first leg while maintaining connectivity for the call.

20 ~~33.~~ A method for avoiding a hairpin loop scenario in a telecommunications system having at least a redirecting switch and a service platform switch, the method comprising:

receiving at the redirecting switch a call for which processing at the service platform switch is to be performed;

25 routing the call as an outgoing call leg to the service platform switch over a trunk out of a trunk group designated as an outgoing hairpin loop trunk type, the routing comprising sending an Initial Address Message to the service platform switch, the Initial Address Message comprising an outgoing number;

30 receiving at the redirecting switch an incoming call leg on a trunk out of a trunk group designated as an incoming hairpin loop trunk type, the call comprising an Initial Address Message comprising an incoming identifier and a called party number;

correlating the outgoing call leg and the incoming call leg by determining that the outgoing number and the incoming identifier are identical;

responsive to correlating the outgoing call leg and the incoming call leg,
releasing the incoming call leg; and
routing the call to the called party number.

5 ~~34.~~ A method for dynamic correlation of call legs, the method comprising:

receiving a first incoming call leg from a call source;
providing a first outgoing call leg associated with the first incoming call leg
to a service platform, wherein the first outgoing call leg comprises a correlation key;
10 receiving a second incoming call leg from the service platform, wherein the
second incoming call leg comprises the correlation key;
providing a second outgoing call leg associated with the second incoming
call leg to a destination;
employing the correlation key to correlate the first outgoing call leg with the
15 second incoming call leg; and
connecting the first incoming call leg to the second outgoing call leg.

20 ~~35.~~ A telecommunications switch software system for use in a
telecommunications switch, the system comprising:
correlation information retriever logic operable to collect call set up
signaling information from a call leg directed from the switch to another switch and
store the information;
incoming call leg monitor logic operable to compare call set up signaling
information from the call leg directed from the switch with call set up signaling
25 information from a call leg directed to the switch; and
hairpin loop avoider logic operable to remove at least the call leg directed
from the switch to another switch upon detection of a match between call set up
signaling information from the call leg directed from the switch and call set up
signaling information directed to the switch.

30 36. The system of claim 35, wherein the signaling information from the
call leg directed from the switch comprises an Automatic Number Identification.

37. The system of claim 35 further comprising:

a stored pool of identities dedicated for use by the switch software system;

and

5 identity substituter logic for replacing an actual identity with an identity selected from the pool of identities.

38. A system for tracking call legs between a first switch and a second switch, the system comprising:

10 means for storing call set up signaling information for a call leg directed from the first switch to the second switch as correlation information;

means for comparing the correlation information against call set up signaling information for a call leg directed from the second switch back to the first switch; and

15 means operable to detect a match between the correlation information and the call set up signaling information for the call leg directed from the second switch back to the first switch and further operable for removing the call leg directed from the first switch to the second switch and the call leg directed from the second switch back to the first switch after detecting the match.

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39. The system of claim 38 further comprising:

temporary identifier selection logic operable to select a temporary identifier;

substitution logic operable to substitute the temporary identifier for an identifier related with a call leg for use as the correlation information; and

25 restoration logic operable to restore the identifier related with the call leg after the match is detected.

40. A method of upgrading a telecommunications switching system to avoid a hairpin loop scenario, the method comprising:

- 5 upgrading at least one switch in the switching system to implement correlation to correlate call legs in the hairpin loop scenario and release at least one call leg in a hairpin loop responsive to the correlation;

wherein the correlation is based on call setup signaling supported by the switch, and the switch accommodates a hairpin loop with at least one service platform switch that need not be upgraded to avoid the hairpin loop scenario.